

PATENT SPECIFICATION



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PROVISIONAL SPECIFICATION

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Improvements in or relating to Feeding Apparatus

We, CYRIL BEST, a British Subject, and MOLINS MACHINE COMPANY, LIMITED, a British Company, both of 2, Evelyn Street, Deptford, London, S.E.8, do hereby declare the nature of this invention to be as follows:—

This invention concerns improvements in or relating to feeding apparatus of the kind in which a bullet-envelope, hereinafter referred to as an "envelope", is delivered laterally between the upper ends of downwardly directed pairs of guides having opposed faces, of which the faces of one pair converge towards those of the other, the guides of each pair having a space between them to receive only the smaller end or nose of an envelope and an abutment between them to limit the downward movement of the nose of an envelope and thus enable the envelope to be turned about its nose so that the envelope may fall base first. This feeding apparatus will be referred to below as "feeding apparatus of the kind described".

In one known construction the bullets are delivered from the container through an outlet after which the bullets are received on a retractable support from which they are moved laterally by a reciprocating pusher-member. The pusher-member moves the bullets laterally so that they lie lengthwise between the upper ends of two pairs of downwardly directed converging guides. The pairs of converging guides have opposed faces, each pair being formed, if desired, from a block provided with a groove extending lengthwise thereof thus providing a pair of guides. The grooves are arranged to receive the smaller end or nose of a bullet, but the grooves are not sufficiently wide for the larger end of the bullet to fall into the grooves. The weight of the bullet at the larger end thereof is greater than that at the nose of the bullet so that when feeding bullets, the nose of the bullet which is located in one of the grooves moves further into the groove as the bullet in its downward movement is moved endwise by the converging guides which are in engagement with the larger end of the bullet. At a certain distance

down, shoulders are provided in the grooves so that the nose of the bullet rests on a shoulder which thus acts as a fulcrum about which the bullet turns so that it can fall base first. By this means, all of the bullets issue from the lower ends of the converging guides with their larger ends directed downwardly. When, however, it is desired to use similar apparatus for feeding bullet-envelopes, which are very much lighter, the envelopes do not readily fall down.

According to the present invention there is provided feeding apparatus of the kind described wherein a movable element is adapted to engage an envelope positioned lengthwise between the pairs of converging guides at a position adjacent the larger end of the envelope and is so arranged that it applies a pressure having a downward component so that the envelope issues from the guides with its larger end foremost. The movable element may comprise a pusher element which has a component of movement downwards when engaging an envelope.

One embodiment of the invention will now be described by way of example. The envelopes which are to be fed are contained in a container similar to that described in co-pending British Patent Application No. 2772/41, (Serial No. 547,500) and are delivered to the outlet of the container by the disc described in the specification of the said co-pending British Application. Below the outlet there are provided two pairs of downwardly directed guides having opposed faces, of which the faces of one pair converge towards those of the other pair. The guides of each pair have a space between them, e.g. formed by a lengthwise groove, to receive the smaller end or nose of an envelope. The grooves, however, are not sufficiently wide to permit the larger end of an envelope to be inserted into the groove. The reason for providing each of the guides with a groove is that the bullets move from the outlet of the container sometimes facing one direction and sometimes the opposite direction. It is, however, desired that when the envelopes issue from the guides, they

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shall all issue with their larger ends foremost. For this purpose, an abutment or shoulder is provided between each pair of guides, so that the downward movement of the nose of an envelope between a pair of guides is arrested by the abutment. On further downward movement the envelope must therefore turn on its nose, so that the envelope can fall base first.

As an envelope issues from the outlet it is received by a retractable support which is located above the pairs of converging guides. The envelope is moved laterally from the retractable support and is deposited between the pairs of guides so that it lies lengthwise between the upper ends of the pairs of converging guides. Front and rear walls are provided to ensure that the envelopes are located between the pairs of converging guides.

Above the pairs of converging guides there is provided a pusher-element which comprises two narrow plates spaced apart from each other by a distance such that in whichever direction an envelope lies between the upper ends of the converging guides, one of the narrow plates will engage the envelope at a position adjacent the larger end thereof. The distance between the narrow plates is, therefore, less than the length of an envelope. The lower ends of the plates are arranged at the same level so that only one of the plates will engage an envelope, because the envelope of course, has a taper towards its nose. The narrow plates are mounted on a carrier which is reciprocated in a vertical plane by means of link mechanism, the movement of which is controlled by a cam on the shaft which drives the disc in the container. By this arrangement, it does not matter in which direction an envelope lies between the pairs of converging guides, since if the envelope does not naturally fall in the desired manner, the larger end of the envelope is engaged by one of the thin

plates as the latter moves downwardly. The larger end of the envelope is therefore pressed downwardly while the nose of the envelope moves inwardly into the groove in which it is located, the nose, in the meanwhile, being supported on the abutment or shoulder, the whole envelope thus being caused to turn about its nose, so that it issues from the converging guides with its larger end foremost.

At the lower end of the converging guides there is provided a guide passage into which envelopes are directed with their larger ends foremost. This guide passage guides the envelopes downwardly towards the position to which it is desired to feed the envelopes. At a position just above the opening at the inlet end of the guide passage, a detector-element is movable and is arranged to detect when the guide passage is full of envelopes. This detector is connected with the plunger which moves the envelopes laterally from the retractable support and the detector is so arranged that when it determines that the guide passage contains a sufficient number of envelopes, the plunger is prevented from moving further envelopes laterally until the quantity of envelopes in the guide passage is reduced. While the plunger is prevented from moving further envelopes laterally from the retractable support, the upper surface of the plunger comprises a continuation of or a part of the support over which the envelopes are moved by the slots in the rotating disc which is located in the container. Thus, when the plunger is prevented from feeding further envelopes laterally the envelopes which are moved towards the outlet by the disc, pass over the outlet and are not delivered from the container.

Dated the 25th day of February, 1941.

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Agent for the Applicants.

COMPLETE SPECIFICATION

Improvements in or relating to Feeding Apparatus

We, CYRIL BEST, a British Subject, and MOLINS MACHINE COMPANY, LIMITED, a British Company, both of 2, Evelyn Street, Deptford, London, S.E.8, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention concerns improvements

in or relating to feeding apparatus of the kind in which a bullet-envelope, hereinafter referred to as an "envelope", is delivered laterally between the upper ends of downwardly directed pairs of guides having opposed faces, of which the faces of one pair converge towards those of the other, the guides of each pair having a space between them to receive only the smaller end or nose of an envelope and

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an abutment between them to limit the downward movement of the nose of an envelope and thus enable the envelope to be turned about its nose so that the envelope may fall base first. This feeding apparatus will be referred to below as "feeding apparatus of the kind described".

In one known construction bullets are delivered from the container through an outlet after which the bullets are received on a support from which they are moved laterally by a reciprocating pusher-member. The pusher-member moves the bullets laterally so that they lie lengthwise between the upper ends of two pairs of downwardly directed converging guides. The pairs of converging guides have opposed faces, each pair being formed, if desired, from a block provided with a groove extending lengthwise thereof thus providing a pair of guides. The grooves are arranged to receive the smaller end or nose of a bullet, but the grooves are not sufficiently wide for the larger end of the bullet to fall into the grooves. The weight of the bullet at the larger end thereof is greater than that at the nose of the bullet so that when feeding bullets, the nose of the bullet which is located in one of the grooves, moves further into the groove as the bullet in its downward movement is moved endwise by the converging guide which is in engagement with the larger end of the bullet. At a certain distance down, shoulders are provided in the grooves so that the nose of the bullet rests on a shoulder which thus acts as a fulcrum about which the bullet turns so that it can fall base first. By this means, all of the bullets issue from the lower ends of the converging guides with their larger ends directed downwardly. When, however, it is desired to use similar apparatus for feeding bullet-

envelopes, which are very much lighter, the envelopes do not readily fall down. According to the present invention there is provided feeding apparatus of the kind described wherein a movable element is adapted to engage an envelope positioned lengthwise between the pairs of converging guides at a position adjacent the larger end of the envelope and is so arranged that it applies a pressure having a downward component so that the envelope issues from the guides with its larger end foremost. The movable element may comprise a pusher element which has a component of movement downwards when engaging an envelope.

One embodiment of the invention will now be described by way of example with reference to the accompanying drawings in which:—

Figure 1 shows a sectional side elevation of part of an envelope feeding apparatus.

Figure 2 is an end elevation of part of Figure 1.

Figure 3 is a diagram illustrating certain parts of Figure 2 more clearly.

Figure 4 is a section of Figure 3 on the line AB.

Referring to the drawings, the envelopes E which are to be fed are contained in a container 2 similar to that described in co-pending British Patent Application No. 2772/41, (Serial No. 547,500) and are delivered to the outlet 3 of the container by the disc 6 having slots 7 as described in the specification of the said co-pending British Application. Below the outlet there is provided a pair of downwardly directed guides 8 having opposed faces. The guides are provided with small grooved insets 9 having grooves 10 so shaped as to receive the smaller end or nose of an envelope. These grooved insets thus constitute the pairs of converging guides previously mentioned. The grooves, however, are not sufficiently wide to permit the larger end of an envelope to be inserted into the groove. The reason for providing each of the guides 8 with a groove or inset is that the envelopes move from the outlet of the container sometimes facing one direction and sometimes facing in the opposite direction. It is, however, desired that when the envelopes issue from the guides, i.e. the grooves 10, they shall all issue with their larger ends foremost. For this purpose, an abutment or shoulder is provided for each groove, so that the downward movement of the nose of an envelope between a pair of guides 9 is arrested by the abutment. As shown, the abutments 11 are formed by the edges of the slots in which the insets 9 are fitted. On further downward movement the envelope must therefore turn on its nose, so that the envelope can fall base first.

As a slot 7 passes the position shown in Figure 1, an envelope contained therein falls on to a support 12 from which it is pushed by a reciprocating pusher 13 so that it enters the top space of the guides 8 and is temporarily supported by a retractable support 14 integral with the pusher 13 and thus movable therewith. The pusher is reciprocated by a lever 15 pivoted at 16 and operated by a lever 17 and link 18, the latter being connected to a cam lever 19 having a roller 20 engaging a cam 21. A return spring 22 is also provided. The cam is fixed on a shaft 23 which carries a worm, shown in the specification referred to, and which engages a wormwheel on the spindle of the disc 6.

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All the mechanism referred to in this paragraph is of known construction but is described in detail as the link 18 has to fulfil a further function in the present case.

The guides 8 are fixed to a bracket 24 which forms a rear wall of the guide passage and a front wall is formed by a gate 25 hinged at 26. In the space between the guides a detector 27 is provided which is movable with the lever 15 and is constructed and operated in the known manner.

Above the pairs of converging guides 10 there is provided a pusher-element 28 which comprises two narrow plates 29 spaced apart from each other by a distance such that in whichever direction an envelope lies between the upper ends of the converging guides, one of the narrow plates will engage the envelope at a position adjacent the larger end thereof, see Figure 3. The distance between the narrow plates is, therefore, less than the length of an envelope. The lower ends of the plates are arranged at the same level so that only one of the plates will usually engage an envelope, because the envelope of course, has a taper towards its nose.

The narrow plates may be, for example, mounted on a carrier which is reciprocated in a vertical plane by means of link mechanism, the movement of which is controlled by a cam on the shaft which drives the disc in the container. As shown, however, the pusher element is fixed to a spindle 30 journaled in a bearing bracket 31. A crank 32 is fixed to the spindle 30 and is provided with a roller 33 which is kept in engagement with the end of the link 18 by a spring 34. Thus as the cam 21 oscillates the link 18 to effect delivery of the envelopes to the guides 8, the pusher element 28 is oscillated about the axis of the spindle 30. In Figure 2, for clearness, the element 28 is shown with the plates 29 extending upwardly but in Figure 1 the parts are shown in dotted lines in the operative position and in chain lines in the position occupied at the other end of the cam stroke. As the retractable support 14 is withdrawn, the envelope is free to fall and as the pusher element 28 engages it at this time, the element presses on the envelope and ensures that it falls in the correct way. The spring 34 can stretch in the event of a jam and prevent injury to the parts.

By this arrangement, it does not matter in which direction an envelope lies between the pairs of converging guides, since if the envelope does not naturally fall in the desired manner, the larger end of the envelope is engaged by one of the thin plates as the latter moves down-

wardly. The larger end of the envelope is therefore pressed downwardly while the nose of the envelope moves inwardly into the groove 10 in which it is located, the nose, in the meanwhile, being supported on the abutment or shoulder 11, the whole envelope thus being caused to turn about its nose, so that it issues from the converging guides with its larger end foremost.

Instead of the oscillating pusher element above described, a wedge-shaped member arranged to reciprocate transversely of the width of the passage formed by the insets 9 might be used. In this case the pusher element would exert on an envelope a pressure having a downward component, whereas in the case illustrated the pusher has a downward component of movement. The lower portions of the guide 8 form a guide passage 80 into which envelopes are directed with their larger ends foremost. This guide passage 80 guides the envelopes downwardly towards the position to which it is desired to feed the envelopes. The known detector-element 27 is arranged above the guide passage 80 and detects when the guide passage is full of envelopes. This detector is, as previously mentioned, connected with the pusher 13 which moves the envelopes laterally from the support 12 and the detector is so arranged that when it determines that the guide passage contains a sufficient number of envelopes, the pusher 13 is prevented from moving further envelopes laterally until the quantity of envelopes in the guide passage is reduced. While the pusher 13 is prevented from moving further envelopes laterally from the support, the upper surface of the pusher 13 comprises a continuation of or a part of the support over which the envelopes are moved by the slots in the rotating disc which is located in the container. Thus, when the pusher is prevented from feeding further envelopes laterally, the envelopes which are moved towards the outlet by the disc, pass over the outlet and are not delivered from the container.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. Feeding apparatus of the kind described wherein a movable element is adapted to engage an envelope positioned lengthwise between the pairs of converging guides at a position adjacent the larger end of the envelope and is so arranged that it applies a pressure having a downward component so that the envelope issues from the guides with its

larger end foremost.

2. Feeding apparatus as claimed in Claim 1, wherein the movable element comprises a pusher element which has a component of movement downwards when engaging an envelope.

3. Feeding apparatus as claimed in Claim 2, wherein the pusher element is rotatably mounted and operated in timed relationship with the devices which feed envelopes to the converging guides.

4. Feeding apparatus as claimed in any of the preceding claims, wherein the movable element comprises two plates spaced apart from each other by a distance such that in whichever direction an envelope lies between the upper ends of the converging guides one plate will en-

gage the envelope at a position adjacent the larger end thereof.

5. Feeding apparatus as claimed in any of the preceding claims, wherein the movable element is spring urged into engagement with an envelope.

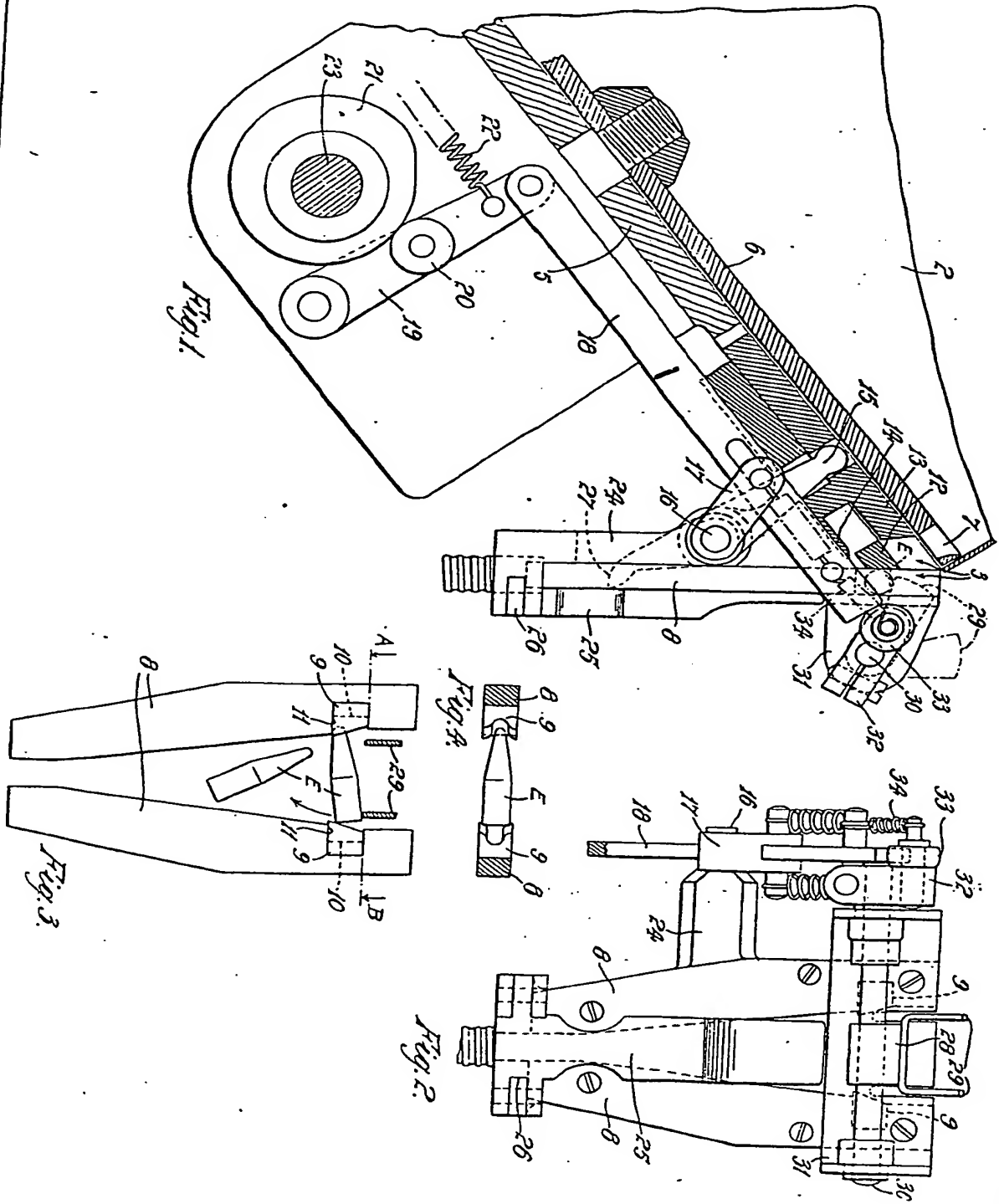
6. Feeding apparatus of the kind described, constructed, arranged and adapted to operate substantially as herein described and shown on the accompanying drawings.

Dated the 27th day of February, 1942.

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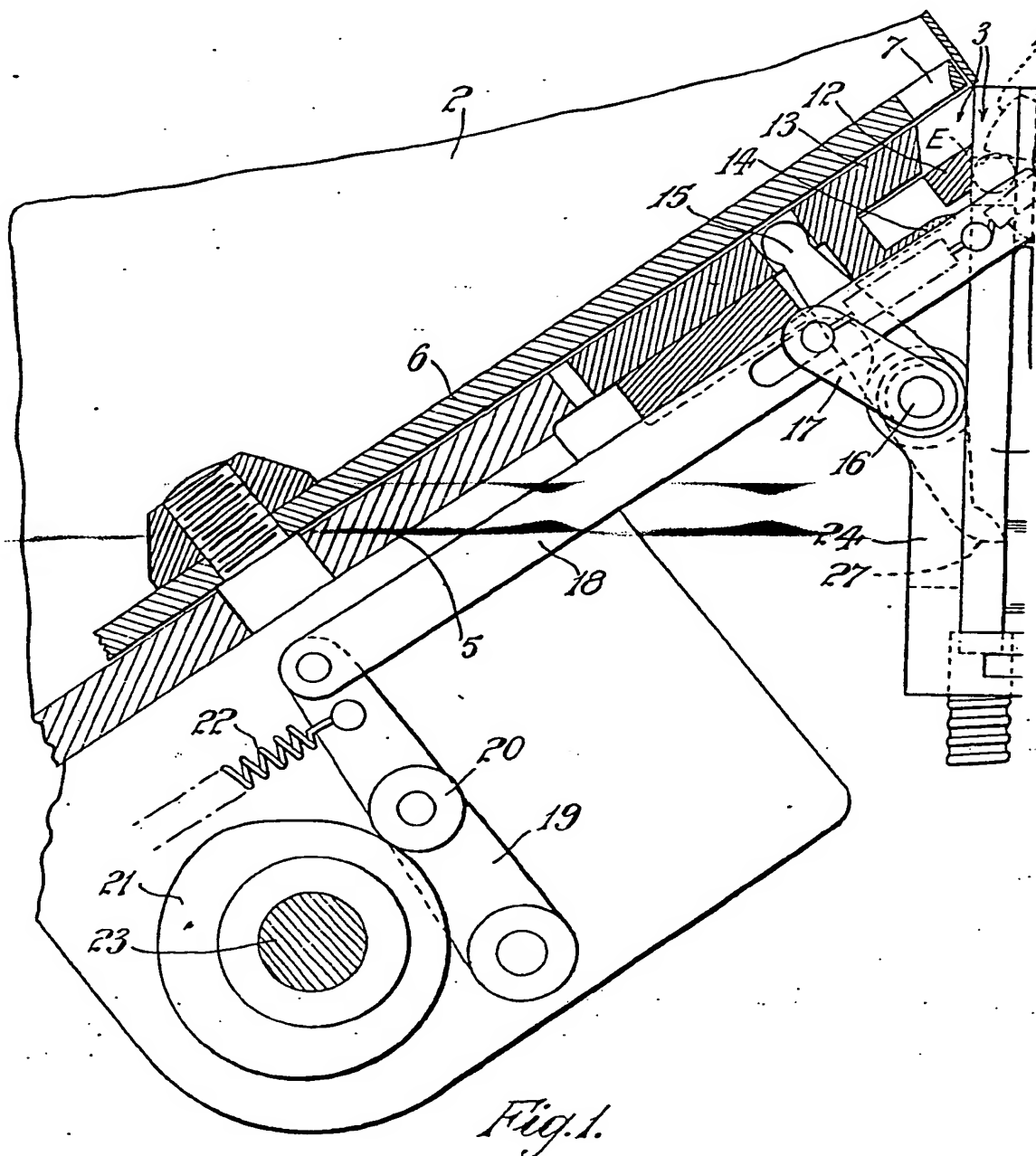
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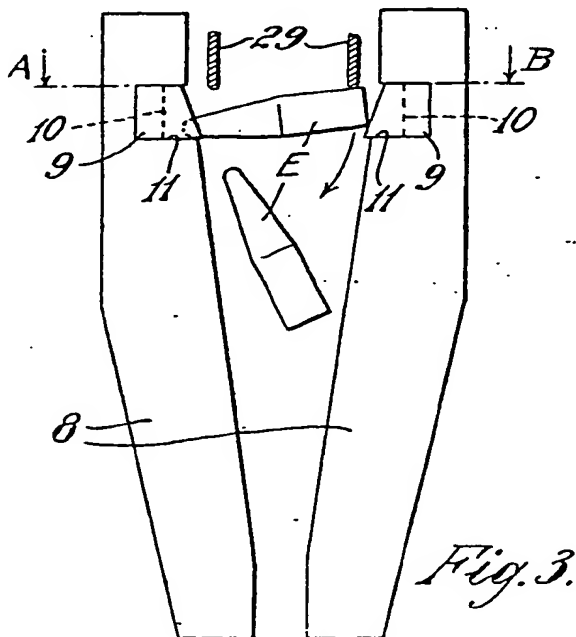
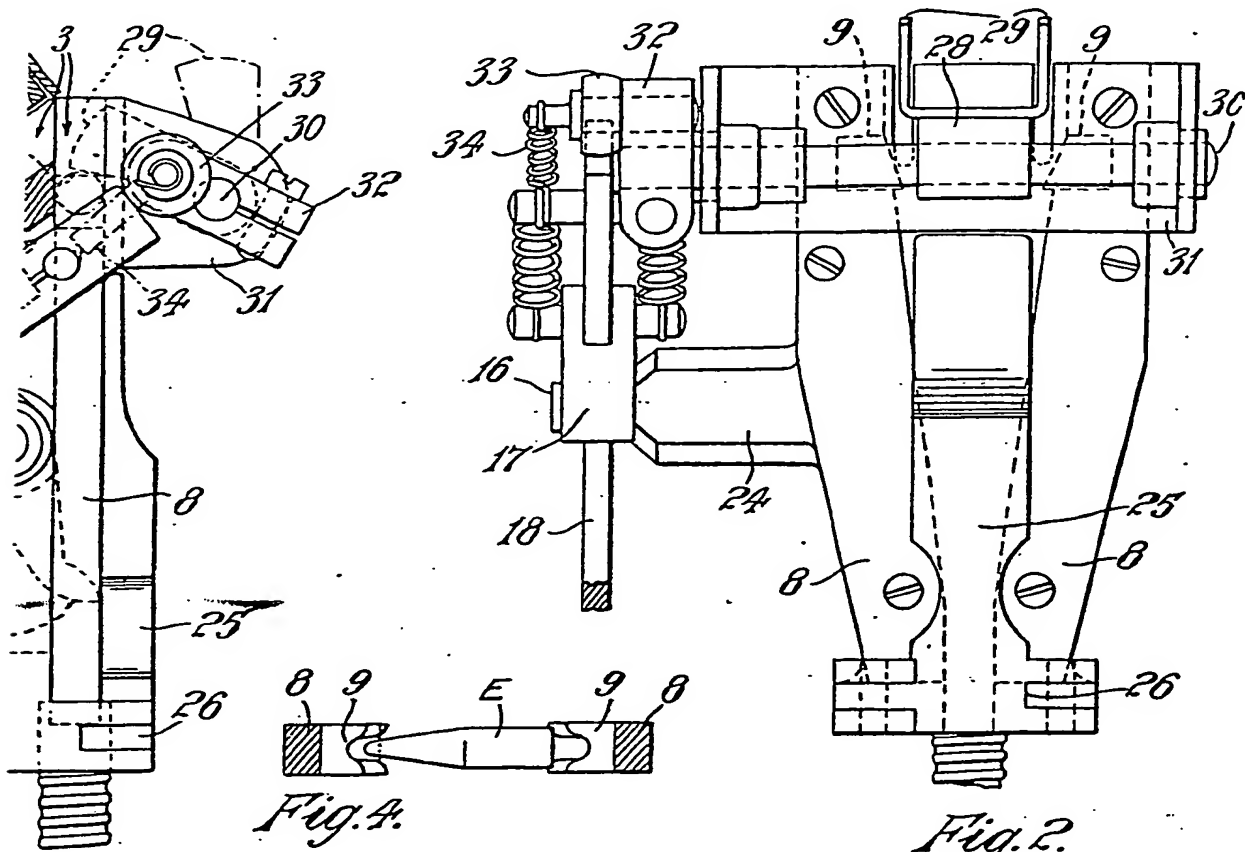
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1 SHEET

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